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Infestation and management of *Cuscuta*- a parasitic weed in jute and mesta

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Dodder (*Cuscuta* spp.), also known as *Akashbel*, *Amarbal*, or S*warnalata* etc. is a parasitic angiosperm belonging to the family Cuscutaceae. It infests almost all crops except crops of *Poacece* family (Mishra et al 2006). Jute crop was not reported to host of *Cuscuta* in past but recently this parasitic weed has been observed to infest jute and mesta in Barrackpore and Madhavpur area of North- 24 Parganas and at CRIJAF research farm, Barrackpore

Parasitism:

Cuscuta seeds usually germinate on or near the soil surface. Its seedlings are rootless and have leafless stem. After emergence, the seedlings twin around the leaf or stem of host plant (Fig. 1). Haustoria from the *Cuscuta* penetrate the host and establish a parasitic union. Once the *Cuscuta* is attached to a host plant, it remains parasitic until harvest. It reproduces mainly by seeds and to a lesser extent by shoot fragments.

Fig. 1. *Cuscuta* vine twin around jute plant.

Losses:

The *Cuscuta* entangles into jute plant damaged the bark through its twining vines. It also bends the top portion of stem and causes mechanical damage to the plant lead to complete loss of jute fibre if not control on time i.e. 10-20 days of crop growth stage (Fig.2 &3). The reduction in fibre yield was up to 50% by damage of bark by vine of *Cuscuta*, even it was controlled manually by hand pulling at 50-60 days of crop growth stage.

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Fig. 2 Infestaion of *Cuscuta* in kenaf

Fig 3. Infetation of *Cuscuta* in jute

Fig 4 : Bark damaged by *Cuscuta* vine

Management:

It is extremely difficult to achieve complete control of *Cuscuta* because its seeds have a hard seed coat, can remain viable in soil for many years, and continue to germinate and emerge throughout the year. However, by following methods we can reduce the infestation of *Cuscuta*

A. **Non chemical methods**:

i. Preventive method: It means we should stop entry of *Cuscuta* seed from infestation area. It includes use of clean crop seed, crop rotation etc. are little bit effective to restrict the spread of this crop associated weed.

ii. Deep ploughing: *Cuscuta* seeds do not germinate if placed in deep in soil. Deep ploughing of *Cuscuta* infested field reduced the chances of the parasite and establishing from the most fresh dispersed seeds, however, older seed in the soil may be brought to the surface by this practice (Mishra et al., 2003). Therefore, tillage i.e. deep ploughing in one season followed by shallow or minimum tillage for next years may be done to avoid bringing *Cuscuta* seeds back to the surface.

B. Hand pulling: This is the simplest and most effective method of controlling *Cuscuta*. In this practice, vine of *Cuscuta* pulled out before flowering with host plant and buried in soil. If flowering and seed set has already occurred, the pulled material must be removed from the field and eventually burnt or buried deep 40-50 cm. But delay in manually pulling lead to damage of bark and thereby the fibre (fig 4) and it is costly too.

C. **Chemical method**: Meagre of selective chemical/ herbicides are available for control *Cuscuta* in crops. However, pendimethalin as pre-emergence has been

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reported to control *Cuscuta* in linseed, niger, lucerne etc., (Moorthy et al, 2003, Moorthy et al. 2004) but this herbicide is not selective for jute and metsa. Further, a highly selective herbicide is required to destroy the nature of attachment and association between host and this holistic parasitic weed. Many post-emergence herbicides which inhibit protein synthesis like quizalofop ethyl, propaquizafop, fenoxaprop ethyl and ethoxysulfuron were screened out for an effective control of *Cuscuta.* Among them ethoxysulfuron was observed to be effective for controlling the *Cuscuta* in jute and mesta/kenaf (Kumar et al., 2020). Application of ethoxysulfuron 15 WG @ 0.075 g /litre of water (i.e 75 ppm conc., or 0.5 g/lirte commercial product) at 35-40 days of crop age and consecutive spray of same dose at 10-12 days after first spray effectively controlled the *Cuscut*a in jute (Fig 5). If *Cuscuta* infestation was observed at later stage of crop growth (50-60 DAS) of jute crop the higher dose of herbicide is required i.e. ethoxysulfuron 15 WG @ 0.15 g /litre, 150 ppm conc. (1.0 g/lirte commercial product) and second spray of same dose at 10-12 days after spray.

Conclusion:

Two sprays of ethoxysulfuron 15 WG @ 0.075 g /litre of water (i.e. 75 ppm conc., or 0.5 g/litre commercial product), first at 35-40 days of crop growth stage and second at 45-50 days effectively controlled the *Cuscut*a in jute. If cuscuta noticed in alter crop growth stage at 50-60 days dose may be increased upto 0.15 g /litre, 150 ppm conc. (1.0 g/lirte commercial product) for effective control of *Cuscuta* in jute and mesta

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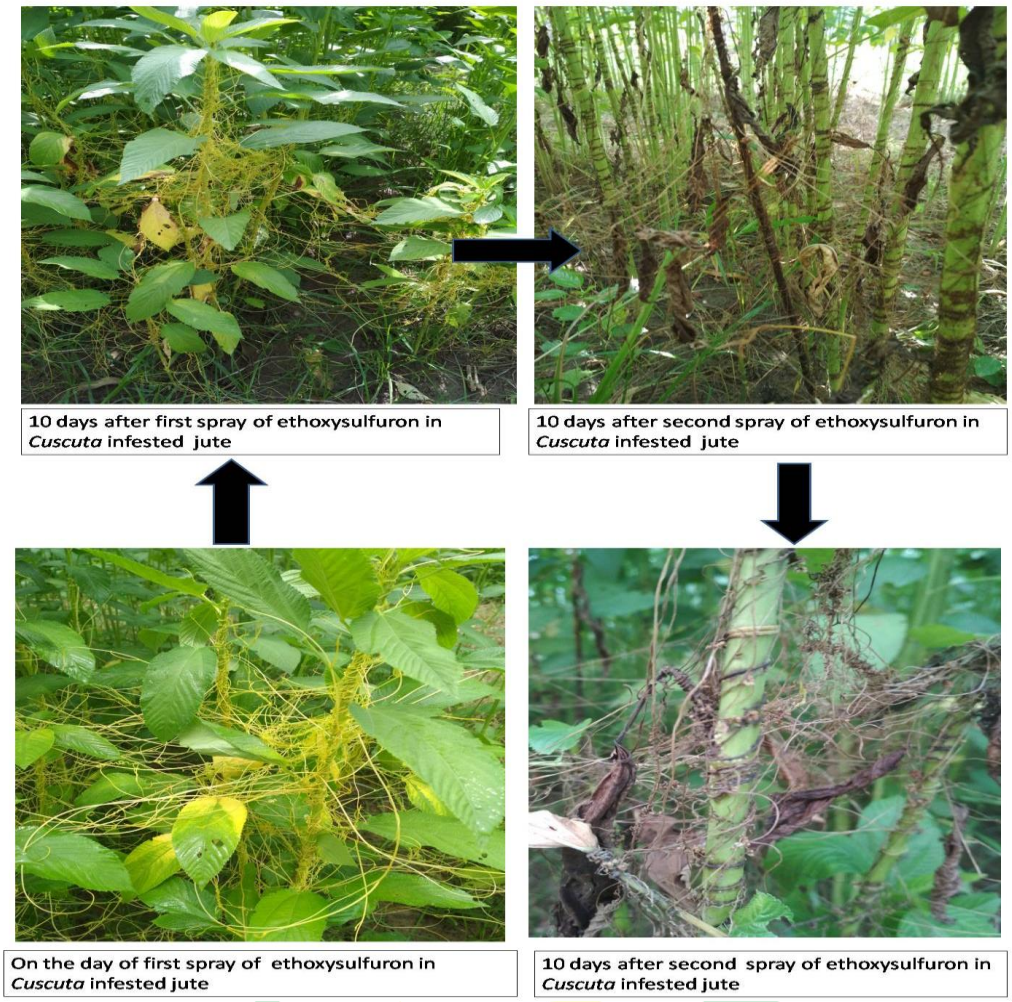

Fig. 5. Symptoms of *Cuscuta* after spray of ethoxysulfuron at different stages.

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